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Role of epidermal growth factor (EGF) and its receptor in the development of the human placenta.

Maruo T, Matsuo H, Otani T, Mochizuki M.

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To elucidate the role of EGF in human placental development, effects of EGF on the proliferation and differentiation of trophoblasts were investigated. Explants of trophoblastic tissues obtained from 4-5 week or 6-12 week placentas were, respectively, cultured with or without EGF, in the presence or absence of triodo-L-thyronine (T3) in a serum-free condition. The proliferative activity was examined by immunocytochemical staining with an antibody Ki-67, and the differentiated function was assessed by the ability to secrete human chorionic gonadotrophin (hCG) and human placental lactogen (hPL). In 4-5 week placentas, EGF and EGF receptor were localized in cytotrophoblast (C-cell), and EGF augmented the proliferation of C-cell without affecting the ability to secrete hCG and hPL. In contrast, in 6-12 week placentas, EGF and EGF receptor were localized in syncytiotrophoblast (S-cell), and EGF stimulated the secretion of hCG and hPL without affecting the proliferation of C-cell. In situ hybridization with c-erb B probe revealed that c-erb B mRNA is expressed in the S-cell after 6 weeks' gestation. Column chromatography of the serum-free media obtained by 5-day culture of early placental tissues resulted in the elution of immunoreactive EGF. The addition of T3 (10^{-8} mol L $^{-1}$) resulted in increased secretion of immunoreactive EGF by placental explants. These findings suggest that EGF acts as an autocrine factor in regulating early placental growth and function in synergy with thyroid hormone.

Publication Types:

- Review
- Review, Tutorial

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